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Resonant Multi-Wave X-Ray Diffraction Study on Iron Oxides System SHIH-CHANG WENG, YEN-RU LEE, JHENG-GANG CHEN, CHIA-HUNG CHU, SHIH-LIN CHANG, National Tsing Hua University — The resonant X-ray scattering occurs when the incident photon energy is close to an absorption edge of a constituent atom. Under such circumstances, the corresponding atomic scattering factor will be modified due to anomalous dispersion, which is directly related to unoccupied states, magnetic moment, charge distribution, and the types of near-neighbor atoms. Therefore, the resonant X-ray scattering is widely used to investigate crystal structure, electronic structure, magnetic property and charge distribution, etc. On the other hand, the multi-wave diffraction can provide more information about reflection phase than the normal (two-beam) Bragg diffraction. In this paper, we will show that resonant multi-wave diffraction profiles in the vicinity of iron k-edge give the information about charge-ordering/charge distribution of iron oxide systems, such as Fe3O4.

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